

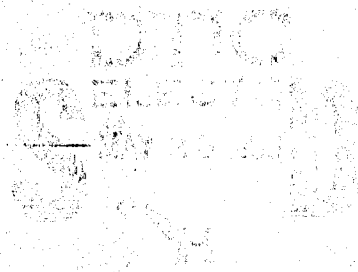
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COST DRIVER ANALYSIS FOR TANK PACK FOODS

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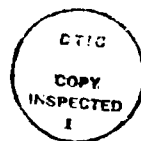
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19. ABSTRACT (Continue on reverse if necessary and identify by block number) This project report identifies and quantifies the major cost factors of the manufacturing process of Tray Pack foods. The purpose of this project is to conduct a cost driver analysis of the manufacturing process so that a system-wide data base of the production, manufacturing and distribution costs of Tray Packs would enable researchers to pinpoint problem areas. The goal of the analysis is to suggest possible cost saving to reduce and control overall costs of manufacturing Tray Packs.					
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PREFACE

Tray Pack foods are one of the primary ration sources for the new Army Combat Field Feeding System. Cost and Quality Control are necessary for all facets of the Tray Pack manufacturing process: from the distribution and warehousing of raw materials, preparation and assembly of menu items, closing and sterilization of the product containers, to the eventual packaging and shipping of the completed assemblies. The purpose of this study is to identify and quantify the major cost factors of the manufacturing process of Tray Pack foods.

The University of Massachusetts Department of Industrial Engineering and Operations Research was charged to conduct the study. The work was performed under Project #1L162724AH99, Joint Services Food/Nutrition Technology Task Area B5 - Subsistence Technology, Technical Effort - Food Processing and Preservation Techniques, Producibility of Thermostabilized Combat Rations. The Project Officers were Joseph W. Szczeblowski and Robert G. Bernazzani.

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Chapter 1. INTRODUCTION

A. Purpose

The overall purpose of this report is to identify and quantify those key cost factors (*cost drivers*) within the manufacturing process of Tray Packs so that the current problem areas can be pinpointed and new innovations, along with new technologies, processes, and equipment can be developed to aid in reducing Tray Pack manufacturing costs. These cost factors are identified and their quantitative impact on manufacturing are assessed.

The Tray Pack manufacturing process is viewed as a series of interrelated component processes and sub-processes concerned with the manufacturing of the different Tray Pack menu items. The report is organized by the component and subcomponent manufacturing processes as well as by the type of the Tray Pack menu item. This report focuses on what *existing* factors affect the manufacturing operations, i.e., what are the key cost component areas that currently exist.

A questionnaire (see Appendix) was designed and was sent to all manufacturers of Tray Packs in the summer of 1986. Within the questionnaire schedule, there were certain questions which alluded to alternative ways of reducing manufacturing costs, but the bulk of the questionnaire focused on documenting and measuring *existing* cost factors in Tray Pack manufacturing.

B. Assumptions

Some of the key assumptions which guided the study were the following:

- i) Performance specifications for the Tray Pack menu items were assumed to be as manufacturers presently understood them.
- ii) Tray Pack volume will likely increase above current fiscal year levels, but the respondents were asked to reply based upon their current manufacturing technologies, i.e., plant, equipment, and operations, not what future changes they were contemplating.
- iii) In the questionnaire, the Tray Pack menu items were categorized in a way which would allow for ease in characterizing and identifying the key cost concerns. Therefore, the Tray Pack menu items are segmented into *four* food categories based on their manufacturability requirements. These four food groups are as follows:

Group A. One Step Filling (16 food items)

Group B. Two Step Filling (39 food items)

Group C. Hand Placement (3 food items)

Group D. Oven Bake (6 food items)

These basic food groups were derived from information available within NATICK with regards to the manufacturability of the Tray Pack menu items. Obviously, the division of the menu items into the food groups may not be the only breakdown, however it provides a useful stepping stone and serves as a guide in the questionnaire for determining the key cost factors in the manufacturing process.

Below are three tables of menu items subdivided into manufacturing types as defined by NATICK:

Table 1: One-Step Menu Items (Group A)

<i>Entrees</i>	<i>Entrees</i>	<i>Starches/Vegts</i>	<i>Desserts</i>
<input type="checkbox"/> BBQ Beef	<input type="checkbox"/> Chicken w/ Noodles	<input type="checkbox"/> Potato Salad	<input type="checkbox"/> Apple Dessert
<input type="checkbox"/> Beef Stew	<input type="checkbox"/> Chili Con Carne	<input type="checkbox"/> Sweet Creamed Corn	<input type="checkbox"/> Apple Sauce
<input type="checkbox"/> Breakfast Bake	<input type="checkbox"/> Creamed Gr. Beef	<input type="checkbox"/>	<input type="checkbox"/> Blueberry Dessert
<input type="checkbox"/> Chicken a la King	<input type="checkbox"/> Eggs w/Ham	<input type="checkbox"/>	<input type="checkbox"/> Chocolate Pudding
<input type="checkbox"/> Chicken Stew/Gravy			<input type="checkbox"/> Cherry Dessert

Table 2: Two Step Menu Items (Group B)

<i>Entrees</i>	<i>Entrees</i>	<i>Starches</i>	<i>Vegts/Desserts</i>
<input type="checkbox"/> BBQ Pork	<input type="checkbox"/> Meatloaf w/Gravy	<input type="checkbox"/> Beans w/Pork	<input type="checkbox"/> Glazed Carrots
<input type="checkbox"/> Beef and Macaroni	<input type="checkbox"/> Pork Sausage Links	<input type="checkbox"/> Buttered Noodles	<input type="checkbox"/> Green Beans
<input type="checkbox"/> Beef Pepper Steak	<input type="checkbox"/> Pork Slices w/Gravy	<input type="checkbox"/> Buttered Potatoes	<input type="checkbox"/> Mixed Vegetables
<input type="checkbox"/> Beef Tips w/Gravy	<input type="checkbox"/> Roast Beef w/Gravy	<input type="checkbox"/> Escalloped Potatoes	<input type="checkbox"/> Peas and Carrots
<input type="checkbox"/> Beef Pot Roast	<input type="checkbox"/> Roast Chicken	<input type="checkbox"/> Macaroni Cheese	<input type="checkbox"/> Peas/Mushrooms
<input type="checkbox"/> Canadian Bacon	<input type="checkbox"/> Spaghetti w/Meatballs	<input type="checkbox"/> Macaroni Salad	<input type="checkbox"/> Sliced Carrots
<input type="checkbox"/> Chicken Breasts	<input type="checkbox"/> Swedish Meatballs	<input type="checkbox"/> Spanish Rice	<input type="checkbox"/> Whole Kernel Corn
<input type="checkbox"/> Chicken Cacciatore	<input type="checkbox"/> Swiss Steak	<input type="checkbox"/> Sweet Potatoes	<input type="checkbox"/> Fruit Cocktail
<input type="checkbox"/> Franks in Brine	<input type="checkbox"/> Turkey Sl.w/Gravy	<input type="checkbox"/> White Rice	<input type="checkbox"/> Sliced Peaches
<input type="checkbox"/> Ham Slices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Sliced Pears
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Pineapple/Syrup

Table 3: Hand-Placement & Oven Bake Menu Items(Groups C & D)

Hand Placement Items

- ☐ Lasagne
- ☐ Stuffed Cabbage
- ☐ Stuffed Peppers

Oven Bake Items

- ☐ Apple Coffee Cake
- ☐ Blueberry Cake
- ☐ Chocolate Cake
- ☐ Marble Cake
- ☐ Pound Cake
- ☐ Spice Cake

For every manufacturer, all Tray Pack items they produced were to be identified so as to insure that the range of manufacturing problems associated with the different menu items could be identified. The results of the problems encountered with each of the menu items is discussed in the Chapters 2 and 3 of the report. In Table 4 below, the FY88 procurement for specific Tray Pack menu items is presented.

Table 4: FY88 Tray Pack Procurement

Item	Quantity (Cans)	Percentage (%) FY88 Procurement
BBQ Beef	42,200	1.05
Beef Stew	82,000	2.04
Chicken ala King	83,000	2.06
Creamed Ground Beef	59,500	1.48
Eggs w/Ham	67,000	1.67
Apple Dessert	143,000	3.56
¹ Beef Pepper Steak	18,300	0.45
Canadian Bacon	-	-
Chicken Breasts	107,000	2.66
Frankfurters in Brine	68,000	1.69
Swiss Steak	71,500	1.78
Turkey Slices w/Gravy	60,000	1.49
Escalloped Potatoes	-	-
Macaroni Cheese	39,000	0.97
Sweet Potatoes	8,500	0.21
Green Beans	92,000	2.29
Mixed Vegetables	130,500	3.24
Peas/Mushrooms	86,000	2.14
² Beans w/Gravy	32,500	0.81
Meatloaf w/Gravy	-	-
Pork Slices w/Gravy	-	-
³ Roast Beef w/Gravy	83,000	2.06
Roast Chicken	-	-
Macaroni Salad	-	-
Peas and Carrots	-	-

¹ Now *Bean w/Bacon*

² Now *Bean Pot Roast*

³ Now *Beef Strips & Green Peppers*

- None procured for FY88

C. Background Information

In order to understand the logic and organization of the study, some definitions of the manufacturing process and its component processes are helpful at this point. We view the manufacturing process as being composed of three separate but interrelated processes:

I. Purchasing: Concerned with the procurement of raw materials, tools, equipment and supplies necessary to the Tray Pack manufacturing process. Purchasing has two sub-component processes:

- 1. Ordering:** Process of acquisition of raw materials and necessary supplies for Tray Pack manufacturing.
- 2. Receiving:** Process of receiving raw materials from rail and truck deliveries, storing of these items, and retrieving these items from the warehouse.

II: Production & Assembly: Concerned with the preparation, fabrication and assembly of food products for the Tray Pack menu items. Production & Assembly have the following four subcomponent processes:

- 3. Preparation:** Process of preparing the raw materials for the specific menu item.
- 4. Filling:** Process of filling the cans with the menu item, inspecting the can contents, weighing the contents, and transferring the cans to the Closing operation.
- 5. Closing:** Process of joining the cans, lids and contents of each can, transferring the can to the seamer, closing the can, washing the can, and collecting the cans into a unit load so they can be transferred to the Sterilization process.
- 6. Sterilization:** Process of loading the unit load of cans into the sterilizer(s), cooking the cans, unloading the cans from the sterilizer(s) and transferring them to the Packaging area.

III: Distribution: Concerned with the carton fabrication, boxing, labelling, palletizing, sheathing and general shipping of completed Tray Pack assemblies. There are two subcomponent processes associated with Distribution:

- 7. Packaging:** Process of forming the cartons, providing pad inserts, boxing the trays, labelling the shipping cartons, palletizing the cartons, sheathing them and transferring them to the shipping warehouse.
- 8. Shipping:** Process of identifying and storing the pallets of Tray Packs, storing for USDA incubation purposes, retrieving them, shipping them on rail or truck, and storing damaged and returned cans.

D. Project Methodology

The questionnaire was organized around questions that sought to identify key cost factors by interrelating the three Manufacturing Processes (I., II., and III.), their eight subprocesses (1. through 8.) and comparing costs with the four food groups (A. through D. of Tables 1, 2 and 3). See Figure 1.

Below is a decision or morphological tree which indicates the general structure or framework around which the cost factors were identified for each food group.

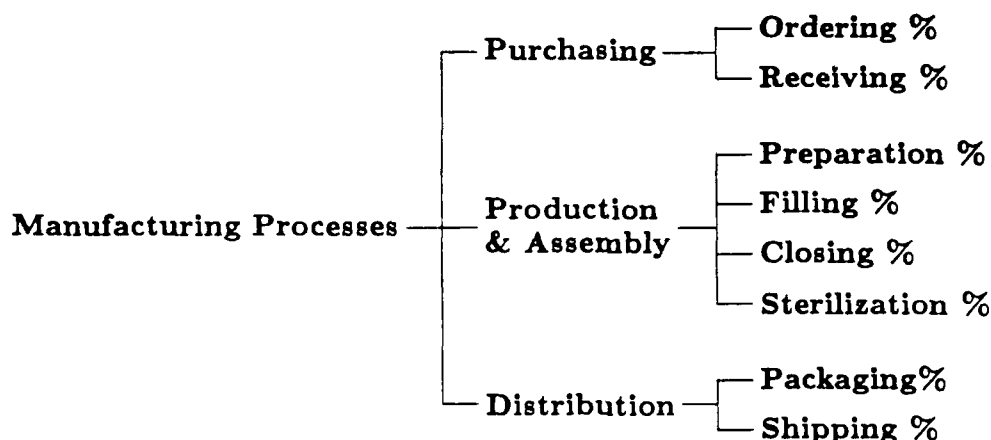


Figure 1: Process Decision Tree

In effect, the main goal of this study was to identify the key cost items of the decision tree so that future investment in plant, equipment and process modifications for the manufacturing of Tray Pack foods could be done in some optimal fashion. At the time of this study, there were seven Tray Pack manufacturers. The questionnaire was mailed out to each manufacturer. Four responded to the questionnaire and the report is written from their responses.

E. General Survey Results

There are some important findings that were revealed through the survey. While many of the cost factors were perhaps already known to most involved in Tray Pack manufacturing, this report has begun to quantify these cost factors in relation to the total manufacturing costs so that future investments in research and development may be better targeted to where improvements in cost savings can be best achieved.

As will be shown throughout the report, most cost improvements can be made within the Production/Assembly operations, namely Filling, Preparation, and Closing. Little improvements in automating these processes presently exist in Tray Pack manufacturing because much of the specialized equipment for Filling, Preparation, and Closing of Tray Pack operations does not either exist or is still in the developmental

stages. Also, demand for Tray Packs has been low, commercial markets are not strong, and little engineering expertise exists either within the manufacturer's operations or within the industry to implement the types of equipment and total line designs which would truly automate these processes. From the survey 73.5% of total manufacturing costs can be attributed to Production and Assembly operations, 21.0% for Distribution operations, while only 5.5% was allocated to Purchasing. Most manufacturers polled in the survey felt that the Packaging process within their plants could achieve the most immediate cost improvement because the activities (boxing the cans, labelling the cartons, palletizing the unit loads and sheathing the pallets) were repetitive and independent of the variety of menu items that tend to make automation difficult for the rest of the activities associated with Tray Packs.

Throughout Chapter 2 and the remainder of the report, we will examine the *detailed* concerns of each manufacturer for each of the eight subprocesses and identify not only what were the key problems and cost factors within each subprocess that occurred, but also what detailed improvements should be made. The results have been combined with regard to the food groups for ease in understanding.

Chapter 2. PROCESS COST FACTORS

This Chapter will focus on the detailed problems, cost factors, and recommendations made by the manufacturers with regards to each of the detailed subprocesses of Tray Pack manufacturing. Within each section of this Chapter, we will summarize the problems and concerns of the manufacturers along with their percentage allocation of the key cost factors within each subprocess. The reader may wish to scan the questions of the questionnaire, see the Appendix, as each section is reviewed to see the type of question asked and how the summary responses correlate with the questions.

A. Ordering Process

Most people have had some problems with the ordering of can/lids from Central States mainly due to the fact that Central States is a single-source supplier, delivery times are slow, and the quality of lids/bottoms are below what they should be.

Printing of the lids is also a problem because of available suppliers, printing costs, lead times, quality of printing and delivery times.

Depending on the producer and his/her location, some have had problems with the general acquisition and supply of meats, dairy, vegetable, starch and dessert raw materials for the Tray Pack menu items. Below is a listing of the menu items mentioned by producers for which problems with ordering occurred along with the reasons for the problem, indicated by the "blackened" squares (Figure 2).

ITEMS	REASONS for Problem		
<input type="checkbox"/> BBQ Beef	<input checked="" type="checkbox"/> Raw Material \$	<input checked="" type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Beef Stew	<input checked="" type="checkbox"/> Raw Material \$	<input checked="" type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Chicken a la King	<input checked="" type="checkbox"/> Raw Material \$	<input checked="" type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Creamed Gr.Beef	<input type="checkbox"/> Raw Material \$	<input checked="" type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Eggs w/Ham	<input checked="" type="checkbox"/> Raw Material \$	<input type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Apple Dessert	<input type="checkbox"/> Raw Material \$	<input checked="" type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Beef Pepper Steak	<input checked="" type="checkbox"/> Raw Material \$	<input checked="" type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Canadian Bacon	<input checked="" type="checkbox"/> Raw Material \$	<input checked="" type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Chicken Breasts	<input checked="" type="checkbox"/> Raw Material \$	<input checked="" type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Franks in Brine	<input checked="" type="checkbox"/> Raw Material \$	<input checked="" type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Swiss Steak	<input checked="" type="checkbox"/> Raw Material \$	<input checked="" type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Turkey Sl.w/Gravy	<input checked="" type="checkbox"/> Raw Material \$	<input checked="" type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Escalloped Potatoes	<input checked="" type="checkbox"/> Raw Material \$	<input checked="" type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Macaroni Cheese	<input checked="" type="checkbox"/> Raw Material \$	<input checked="" type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Sweet Potatoes	<input type="checkbox"/> Raw Material \$	<input checked="" type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Green Beans	<input checked="" type="checkbox"/> Raw Material \$	<input checked="" type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Mixed Vegetables	<input checked="" type="checkbox"/> Raw Material \$	<input type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Peas/Mushrooms	<input checked="" type="checkbox"/> Raw Material \$	<input type="checkbox"/> Material Quality \$	<input type="checkbox"/> Other \$ _____

Figure 2: Ordering Process Menu Item Problems

In general the most significant cost factors center on the raw material costs. Table 5 gives a general percentage breakdown of the cost factors affecting the Ordering process with the cost of raw materials absorbing 2/3 of total Ordering costs, labor requiring 1/10 of the total costs and the other factors are basically insignificant and can be attributed to overhead expenditures.

Table 5: Ordering Costs Percentage Breakdown		%
Raw Material \$	Direct (Food Items/Cans)	66.00
	Indirect (Wastage/Spoilage) . . .	2.00
Labor \$	Direct (Personnel)	10.00
	Indirect (Training/Overtime) . . .	3.00
Equipment \$	Direct (Capital Expenditures) . .	2.00
	Indirect (Operational/Repairs) . .	5.00
Space \$	Direct (Cubic footage)	3.00
	Indirect (Flexibility/Accessibility)	--
Energy \$	Direct (Power/Water/Cooling) . .	6.00
	Indirect (Breakdowns/Weather) .	2.00
Maintenance\$	Direct (Personnel)	--
	Indirect (Accidents/Vermin) . . .	1.00
Administrative\$	Direct (Personnel)	3.00
	Indirect (Copying/Computing) . .	2.00
Summary\$	Grand Total	100.00

B. Receiving Process

For the Receiving process, which is concerned with the receipt of goods and their proper warehousing before being utilized in the preparation of the Tray Pack menu items, some of the menu items have created problems within the warehouse operations of the manufacturers. Figure 3 illustrates those menu items that have resulted in spoilage and significant warehousing costs.

ITEMS	REASONS for Problem		
<input type="checkbox"/> BBQ Beef	<input type="checkbox"/> Spoilage \$	<input checked="" type="checkbox"/> Warehouse \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Creamed Gr.Beef	<input type="checkbox"/> Spoilage \$	<input checked="" type="checkbox"/> Warehouse \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Eggs w/Ham	<input checked="" type="checkbox"/> Spoilage \$	<input checked="" type="checkbox"/> Warehouse \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Apple Dessert	<input type="checkbox"/> Spoilage \$	<input checked="" type="checkbox"/> Warehouse \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Franks in Brine	<input checked="" type="checkbox"/> Spoilage \$	<input type="checkbox"/> Warehouse \$	<input checked="" type="checkbox"/> Other \$: Fresh Time Frame
<input type="checkbox"/> Beans w/Pork	<input checked="" type="checkbox"/> Spoilage \$	<input checked="" type="checkbox"/> Warehouse \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Escalloped Potatoes	<input checked="" type="checkbox"/> Spoilage \$	<input type="checkbox"/> Warehouse \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Sweet Potatoes	<input checked="" type="checkbox"/> Spoilage \$	<input type="checkbox"/> Warehouse \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Green Beans	<input type="checkbox"/> Spoilage \$	<input checked="" type="checkbox"/> Warehouse \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Mixed Vegetables	<input type="checkbox"/> Spoilage \$	<input checked="" type="checkbox"/> Warehouse \$	<input type="checkbox"/> Other \$ _____
<input type="checkbox"/> Peas/Mushrooms	<input type="checkbox"/> Spoilage \$	<input checked="" type="checkbox"/> Warehouse \$	<input type="checkbox"/> Other \$ _____

Figure 3: Receiving Process Menu Item Problems

Table 6 illustrates the cost breakdown for the receiving costs, and as expected, raw material costs account for 3/4 of the cost of the receiving operations and the rest of the costs can be attributed to overhead.

Table 6: Receiving Costs Percentage Breakdown		%
Raw Material \$	Direct (Food Items/Cans)	75.00
	Indirect (Wastage/Spoilage) . . .	2.00
Labor \$	Direct (Personnel)	2.00
	Indirect (Training/Overtime) . . .	1.00
Equipment \$	Direct (Capital Expenditures) . .	--
	Indirect (Operational/Repairs) . .	--
Space \$	Direct (Cubic footage)	4.00
	Indirect (Flexibility/Accessibility)	3.00
Energy \$	Direct (Power/Water/Cooling) . .	4.00
	Indirect (Breakdowns/Weather) .	2.00
Maintenance\$	Direct (Personnel)	--
	Indirect (Accidents/Vermin) . . .	2.00
Administrative\$	Direct (Personnel)	4.00
	Indirect (Copying/Computing) . .	1.00
Summary\$	Grand Total	100.00

Given the emphasis on raw material costs, it is understandable that the manufacturers felt that reducing delivery delays and improving the refrigeration and storage systems would be the wisest means of improving the Receiving process. Figure 4 indicates the recommendations felt to be most important for improving the Receiving process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

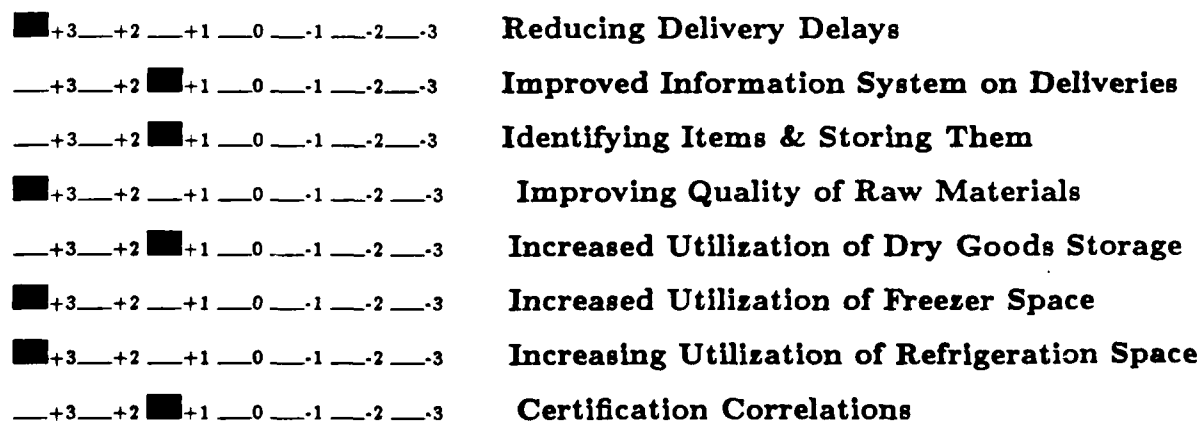


Figure 4: Receiving Process Recommendations

D. Filling Process

For the Filling process, which is concerned with filling the cans with the specified menu item, inspecting the can contents, weighing the contents and transferring the cans to the closing operation, again there are key labor and equipment problems created by the various menu items associated with the Filling process. Not surprisingly, the list of items identified as problematic during the Preparation process is again identified in Figure 7 as problematic during the Filling process.

ITEMS	REASONS for Problem		
<input type="checkbox"/> BBQ Beef	<input checked="" type="checkbox"/> Labor\$	<input checked="" type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Beef Stew	<input checked="" type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Creamed Gr.Beef	<input checked="" type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Eggs w/Ham	<input checked="" type="checkbox"/> Labor\$	<input checked="" type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Apple Dessert	<input checked="" type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Franks in Brine	<input checked="" type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Meatloaf w/Gravy	<input checked="" type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Pork Slices w/Gravy	<input checked="" type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Roast Beef w/Gravy	<input checked="" type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Roast Chicken	<input checked="" type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Swiss Steak	<input type="checkbox"/> Labor\$	<input checked="" type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Turkey Sl.w/Gravy	<input checked="" type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Macaroni Cheese	<input checked="" type="checkbox"/> Labor\$	<input checked="" type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Green Beans	<input checked="" type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Mixed Vegetables	<input checked="" type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Peas/Mushrooms	<input checked="" type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____

Figure 7: Filling Process Menu Item Problems

Also, as may be expected, raw materials loom as the key underlying reason for driving the costs during the Filling process since they control the number and complexity of the filling steps and labor and equipment requirements necessary in filling the Tray Packs.

Ways of automating all aspects of the Filling process dominate the recommendations for improvement. Figure 8 illustrates the strength and importance and types of automation all along the Filling line operation. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*. Later on when we aggregate our cost factors, the Filling operation will turn out to be the most costly of all the operations so it is understandable that any automation of the activities in this process would be beneficial.

Table 8: Filling Costs Percentage Breakdown		%
Raw Material \$	Direct (Food Items/Cans)	73.50
	Indirect (Wastage/Spoilage) . . .	1.00
Labor \$	Direct (Personnel)	10.00
	Indirect (Training/Overtime) . . .	1.00
Equipment \$	Direct (Capital Expenditures) . .	2.00
	Indirect (Operational/Repairs) . .	1.00
Space \$	Direct (Cubic footage)	1.00
	Indirect (Flexibility/Accessibility)	3.00
Energy \$	Direct (Power/Water/Cooling) . .	3.00
	Indirect (Breakdowns/Weather) .	1.00
Maintenance\$	Direct (Personnel)	1.00
	Indirect (Accidents/Vermin) . . .	1.00
Administrative\$	Direct (Personnel)	1.00
	Indirect (Copying/Computing) . .	0.50
Summary\$	Grand Total	100.00

—+3—+2—+1—0—-1—-2—-3	Automated Can and Lid Stacking
—+3—+2—+1—0—-1—-2—-3	Automated Can Washing
■+3—+2—+1—0—-1—-2—-3	Automated Placement of Large Menu Items
■+3—+2—+1—0—-1—-2—-3	Automated Piston & Liquid Filling
■+3—+2—+1—0—-1—-2—-3	Automated Check-Weigh Reject Operations
■+3—+2—+1—0—-1—-2—-3	Automated Can Transfer between Stations
■+3—+2—+1—0—-1—-2—-3	Automated Material Handling

Figure 8: Filling Process Recommendations

E. Closing Process

As can be seen in Figure 9, certain menu items have closing problems. Besides the Lid/Can Merge and Closing Equipment itself, Integrity of the Seam for the listed menu items is a crucial problem.

ITEMS

REASONS for Problem

<input type="checkbox"/> BBQ Beef	<input checked="" type="checkbox"/> Lid/Can Merge\$	<input checked="" type="checkbox"/> Closing Equipt\$	<input checked="" type="checkbox"/> Other\$: Seam Integrity
<input type="checkbox"/> Eggs w/Ham	<input checked="" type="checkbox"/> Lid/Can Merge\$	<input checked="" type="checkbox"/> Closing Equipt\$	<input checked="" type="checkbox"/> Other\$: Seam Integrity
<input type="checkbox"/> Apple Dessert	<input checked="" type="checkbox"/> Lid/Can Merge\$	<input checked="" type="checkbox"/> Closing Equipt\$	<input checked="" type="checkbox"/> Other\$: Seam Integrity
<input type="checkbox"/> Franks in Brine	<input checked="" type="checkbox"/> Lid/Can Merge\$	<input checked="" type="checkbox"/> Closing Equipt\$	<input checked="" type="checkbox"/> Other\$: Seam Integrity
<input type="checkbox"/> Pork Slices w/Gravy	<input checked="" type="checkbox"/> Lid/Can Merge\$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$: Seam Integrity
<input type="checkbox"/> Turkey Sl.w/Gravy	<input checked="" type="checkbox"/> Lid/Can Merge\$	<input checked="" type="checkbox"/> Closing Equipt\$	<input checked="" type="checkbox"/> Other\$: Seam Integrity
<input type="checkbox"/> Beans w/Pork	<input checked="" type="checkbox"/> Lid/Can Merge\$	<input checked="" type="checkbox"/> Closing Equipt\$	<input checked="" type="checkbox"/> Other\$: Seam Integrity
<input type="checkbox"/> Macaroni Cheese	<input checked="" type="checkbox"/> Lid/Can Merge\$	<input checked="" type="checkbox"/> Closing Equipt\$	<input checked="" type="checkbox"/> Other\$: Seam Integrity
<input type="checkbox"/> Green Beans	<input checked="" type="checkbox"/> Lid/Can Merge\$	<input checked="" type="checkbox"/> Closing Equipt\$	<input checked="" type="checkbox"/> Other\$: Seam Integrity
<input type="checkbox"/> Mixed Vegetables	<input checked="" type="checkbox"/> Lid/Can Merge\$	<input checked="" type="checkbox"/> Closing Equipt\$	<input checked="" type="checkbox"/> Other\$: Seam Integrity
<input type="checkbox"/> Peas/Mushrooms	<input checked="" type="checkbox"/> Lid/Can Merge\$	<input checked="" type="checkbox"/> Closing Equipt\$	<input checked="" type="checkbox"/> Other\$: Seam Integrity

Figure 9: Closing Process Menu Item Problems

As is demonstrated in Table 9, 40% of the closing costs are due to equipment problems while 30% are due to labor problems. It is probably due to the frequent breakdowns and closing equipment reliability that the labor costs are so significant.

Table 9: Closing Costs Percentage Breakdown

		%
Labor \$	Direct (Personnel)	33.50
	Indirect (Training/Overtime) ...	5.00
Equipment \$	Direct (Capital Expenditures) ..	10.00
	Indirect (Operational/Repairs) ..	30.00
Space \$	Direct (Cubic footage)	2.00
	Indirect (Flexibility/Accessibility)	3.00
Energy \$	Direct (Power/Water/Cooling) ..	5.00
	Indirect (Breakdowns/Weather) ..	3.00
Maintenance\$	Direct (Personnel)	5.00
	Indirect (Accidents/Vermin)	1.00
Administrative\$	Direct (Personnel)	2.00
	Indirect (Copying/Computing) ..	0.50
Summary\$	Grand Total	100.00

As can be seen in the recommendations made by the manufacturers, material movement of the can between closing and seaming and a faster/more reliable seamer would be most cost effective during the Closing process. Other automatic procedures also are recommended in Figure 10. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

___+3___+2___+1___0___-1___-2___-3	Automated Lid/Tray Merge
■+3___+2___+1___0___-1___-2___-3	Automated Can Transfer between Closure to Seamer
■+3___+2___+1___0___-1___-2___-3	Faster Seaming Process (Reliability/Repair)
___+3___+2___+1___0___-1___-2___-3	Automated Quality Check of Seam
___+3___+2___+1___0___-1___-2___-3	Automated Can Washing at Seamer Outfeed
___+3___+2___+1___0___-1___-2___-3	Automated Stacking of Can into a Unit Load
___+3___+2___+1___0___-1___-2___-3	Handling Full Tray Damage Reduction

Figure 10: Closing Process Recommendations

F. Sterilization Process

Besides controlling the Sterilization process and material handling problems between the seamer and sterilizers and eventual Packaging process, Galvanic Corrosion (chemical reactions between the can and the can contents), Process Times, and High Acid problems on the Apple Dessert item were identified as key problems during the Sterilization process. Figure 11 presents this data.

ITEMS	REASONS for Problem		
<input type="checkbox"/> BBQ Beef	<input checked="" type="checkbox"/> Sterilizer Control\$	<input checked="" type="checkbox"/> Load/Unload\$	<input checked="" type="checkbox"/> Other\$: Galvanic Corrosion
<input type="checkbox"/> Creamed Gr.Beef	<input checked="" type="checkbox"/> Sterilizer Control\$	<input checked="" type="checkbox"/> Load/Unload\$	<input checked="" type="checkbox"/> Other\$_____
<input type="checkbox"/> Eggs w/Ham	<input checked="" type="checkbox"/> Sterilizer Control\$	<input checked="" type="checkbox"/> Load/Unload\$	<input checked="" type="checkbox"/> Other\$ Process Time
<input type="checkbox"/> Apple Dessert	<input type="checkbox"/> Sterilizer Control\$	<input checked="" type="checkbox"/> Load/Unload\$	<input checked="" type="checkbox"/> Other\$: High Acid
<input type="checkbox"/> Franks in Brine	<input checked="" type="checkbox"/> Sterilizer Control\$	<input checked="" type="checkbox"/> Load/Unload\$	<input checked="" type="checkbox"/> Other\$: Galvanic Corrosion
<input type="checkbox"/> Turkey Sl.w/Gravy	<input checked="" type="checkbox"/> Sterilizer Control\$	<input checked="" type="checkbox"/> Load/Unload\$	<input checked="" type="checkbox"/> Other\$: Galvanic Corrosion
<input type="checkbox"/> Macaroni Cheese	<input checked="" type="checkbox"/> Sterilizer Control\$	<input checked="" type="checkbox"/> Load/Unload\$	<input checked="" type="checkbox"/> Other\$: Process Time
<input type="checkbox"/> Green Beans	<input checked="" type="checkbox"/> Sterilizer Control\$	<input checked="" type="checkbox"/> Load/Unload\$	<input checked="" type="checkbox"/> Other\$: Galvanic Corrosion
<input type="checkbox"/> Mixed Vegetables	<input checked="" type="checkbox"/> Sterilizer Control\$	<input checked="" type="checkbox"/> Load/Unload\$	<input checked="" type="checkbox"/> Other\$: Galvanic Corrosion
<input type="checkbox"/> Peas & Carrots	<input checked="" type="checkbox"/> Sterilizer Control\$	<input checked="" type="checkbox"/> Load/Unload\$	<input checked="" type="checkbox"/> Other\$: Galvanic Corrosion
<input type="checkbox"/> Peas/Mushrooms	<input checked="" type="checkbox"/> Sterilizer Control\$	<input checked="" type="checkbox"/> Load/Unload\$	<input checked="" type="checkbox"/> Other\$: Galvanic Corrosion

Figure 11: Sterilization Process Menu Item Problems

The Direct Costs of the Sterilization equipment as well as their Operational and Energy costs largely control costs of the Sterilization process.

Table 10: Sterilization Costs Percentage Breakdown %

Labor \$	<i>Direct (Personnel)</i>	12.00
	<i>Indirect (Training/Overtime)...</i>	2.00
Equipment \$	<i>Direct (Capital Expenditures) ..</i>	30.00
	<i>Indirect (Operational/Repairs) ..</i>	10.00
Space \$	<i>Direct (Cubic footage)</i>	5.00
	<i>Indirect (Flexibility/Accessibility)</i>	5.00
Energy \$	<i>Direct (Power/Water/Cooling) ..</i>	20.00
	<i>Indirect (Breakdowns/Weather) ..</i>	5.00
Maintenance\$	<i>Direct (Personnel)</i>	4.00
	<i>Indirect (Accidents/Vermin)</i>	4.00
Administrative\$	<i>Direct (Personnel)</i>	2.00
	<i>Indirect (Copying/Computing) ..</i>	1.00
Summary\$	Grand Total.....	100.00

Material Handling dominates as the key process improvement of the Sterilization process. For the three recommendations for improvement in the Sterilization process which were recommended by the manufacturers (Figure 12), a +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

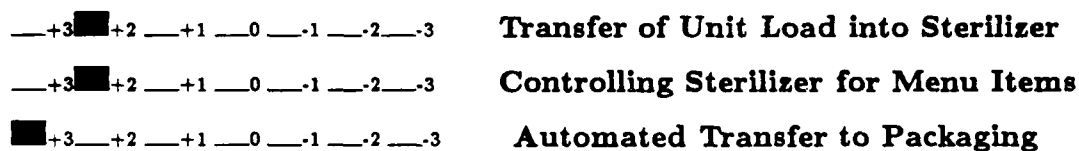


Figure 12: Sterilization Process Recommendations

G. Packaging Process

Since the Packaging process is not really affected by the menu item, no list of problems was requested of the manufacturers. What was found as a result of the cost drivers identified in Table 11, however, was the labor intensity of this process and its impact on costs of the Packaging process. As shown, 70% of the costs of the Packaging process are due to labor.

Table 11: Packaging Costs Percentage Breakdown %

Raw Material \$	<i>Direct (Packaging/Boxing Items)</i>	20.00
	<i>Indirect (Wastage/Spoilage) ...</i>	2.00
Labor \$	<i>Direct (Personnel)</i>	70.00
	<i>Indirect (Training/Overtime) ...</i>	3.00
Equipment \$	<i>Direct (Capital Expenditures) ..</i>	--
	<i>Indirect (Operational/Repairs) ..</i>	--
Space \$	<i>Direct (Cubic footage)</i>	--
	<i>Indirect (Flexibility/Accessibility)</i>	2.00
Energy \$	<i>Direct (Power/Water/Cooling) ..</i>	--
	<i>Indirect (Breakdowns/Weather) ..</i>	--
Maintenance\$	<i>Direct (Personnel)</i>	2.00
	<i>Indirect (Accidents/Vermin)</i>	--
Administrative\$	<i>Direct (Personnel)</i>	1.00
	<i>Indirect (Copying/Computing) ..</i>	--
Summary\$	Grand Total.....	100.00

Automation could play a key role to reducing costs of the Packaging process as Figure 13 demonstrates. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Carton Forming
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Pad Insertion
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Boxing of Cans
___ +3 ___ +2 ■ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Checking of Packaging Quality
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Labelling of Shipping Cartons
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Palletizing of Shipping Cartons
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Sheathing of Unit Load
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Can Cleaning

Figure 13: Packaging Process Recommendations

H. Shipping Process

Finally, as is seen in the cost driver breakdown for the Shipping process, Table 12, Administrative problems loom as the key driver of Shipping costs.

Table 12: Shipping Costs Percentage Breakdown		%
Labor \$	Direct (Personnel)	15.00
	Indirect (Training/Overtime) ...	2.00
Equipment \$	Direct (Capital Expenditures) ..	3.00
	Indirect (Operational/Repairs) ..	1.00
Space \$	Direct (Cubic footage)	20.00
	Indirect (Flexibility/Accessibility)	10.00
Energy \$	Direct (Power/Water/Cooling) ..	--
	Indirect (Breakdowns/Weather) ..	--
Maintenance\$	Direct (Personnel)	--
	Indirect (Accidents/Vermin)	--
Administrative\$	Direct (Personnel)	45.00
	Indirect (Copying/Computing) ..	4.00
Summary\$	Grand Total	100.00

Figure 14 represents the manufacturer's recommendations for controlling costs in the Shipping process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*. These recommendations center on an automated information system for improving cost control in Shipping.

■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Shipping Warehouse Storage
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Order Picking of Stored Cans
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Automated Material Handling/Transfer
■ +3 ___ +2 ___ +1 ___ 0 ___ -1 ___ -2 ___ -3	Computerized Product Accountability

Figure 14: Shipping Process Recommendations

Chapter 3. GENERAL MANUFACTURING PROCESS COST FACTORS

A. General Manufacturing Problems

This last Chapter summarizes all the problems found with the subprocesses and examines which subprocesses are the key cost drivers and recommends in general where cost savings might be identified and focused.

In order to summarize some of the results found in the survey, Table 13 indicates with an X the subprocesses found by the manufacturers that are most problematic for each of the manufactured menu items. The table reflects a composite aggregation of all manufacturer's responses across all subprocesses as discussed in detail in Chapter 2. It is interesting to note that *BBQ Beef, Eggs w/Ham, Apple Dessert, Frankfurters in Brine, Green Beans, Mixed Vegetables, and Peas/Mushrooms* all experienced problems across all the subprocesses. Packaging and Shipping were not included as subprocesses here in Table 13 since all menu items could be improved by increased automation for these activities.

In another summary pass over the data, it is useful to examine how the manufacturers felt about which processes were the most *labor intensive*. Traditionally, labor intensive processes would be the most likely candidates for future automation and technological improvements. Figure 15 below represents their opinion as to the most *labor intensive* processes. A +3 indicates *most labor intensive* while a -3 indicates *least labor intensive*, and a 0 weight indicates *no opinion*.

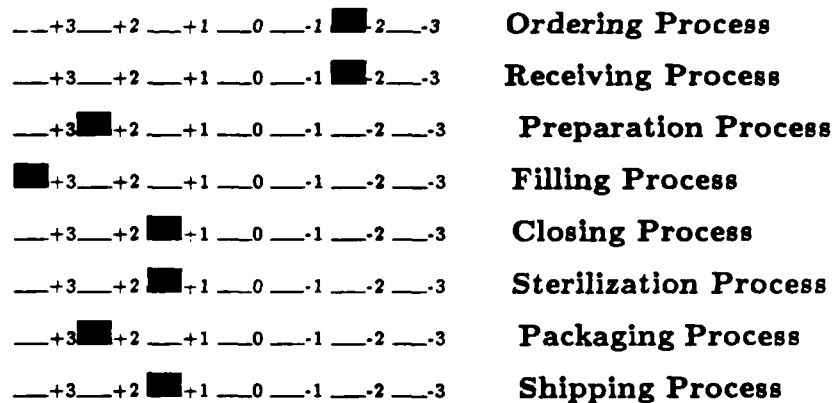


Figure 15: Labor Intensity Chart

Inspecting Figure 15 we see that the three most critical labor intensive processes are Filling, followed by Packaging and finally Preparation. Even though Packaging appears to be tied with Preparation, when the scores are aggregated, Packaging slightly edges out Preparation in being more labor intensive.

That Filling is the most labor intensive is perhaps not surprising, given its labor intensive activities as described in Chapter 2, and the state of the Filling equipment used by the various producers. The lack of adequate Filling equipment is due to the low volume requirements for Tray Packs and the specialized Filling equipment needed to handle the size and range of placement-filling problems for the menu items.

Table 13: Tray Pack Menu Item Problems

Item	Ordering	Receiving	Preparation	Filling	Closing	Sterilization
BBQ Beef	X	X	X	X	X	X
Beef Stew	X		X	X		
Chicken ala King	X					
Creamed Ground Beef	X	X	X	X		X
Eggs w/Ham	X	X	X	X	X	X
Apple Dessert	X	X	X	X	X	X
Beef Pepper Steak	X		X			
Canadian Bacon	X					
Chicken Breasts	X					
Frankfurters in Brine	X	X	X	X	X	X
Swiss Steak	X				X	
Turkey Slices w/Gravy	X		X	X	X	X
Escalloped Potatoes	X	X				
Macaroni Cheese	X			X	X	X
Sweet Potatoes	X	X				
Green Beans	X	X	X	X	X	X
Mixed Vegetables	X	X	X	X	X	X
Peas/Mushrooms	X	X	X	X	X	X
Beans w/Gravy		X	X		X	
Meatloaf w/Gravy			X	X		
Pork Slices w/Gravy			X	X	X	
Roast Beef w/Gravy			X	X		
Roast Chicken			X	X		
Macaroni Salad			X			
Peas and Carrots						X

Packaging's importance over Preparation was slightly more favored by the respondents, although marginally, but it is quite important to future cost savings because of its generality and automation characteristics. While Preparation is a third in this itemization of labor intensive operations, it is very dependent on the type of raw material ingredients and the menu item preparation process unique to those ingredients, whereas Packaging is independent of the menu item and would be one of the most easily implementable technological changes in Tray Pack manufacturing.

To quantify the importance of Figure 15, Table 14 gives the percentage breakdown of total costs over the eight subprocesses. Table 14 illustrates again the order of importance of Filling, Packaging and Preparation as the most critical factors in Tray Pack manufacturing costs. Filling accounts for 36% of total costs while Packaging accounts

for 17% and Preparation accounts for 16.50%.

Again, the independence of the Packaging operation from the others would suggest its importance in cost savings technology for Tray Pack manufacturing. All manufacturers could aid from some form of automated packaging systems: boxing, pad insertion, labelling, palletizing, and pallet sheathing. Various equipment items for automating these operations are described in a previous report.*

B. Cost Factors

Table 14: General Manufacturing Cost Percentages

PROCESS	Percentage of Cost %
Ordering	2.00
Receiving	3.50
Preparation	16.50
Filling	36.00
Closing	10.00
Sterilization	11.00
Packaging	17.00
Shipping	4.00
Grand Total	100.00

* J. MacGregor Smith, *Tray Pack Prototype Plant Design* Technical Report NATICK/TR-87/017, June 1986. (AD A180 296)

Figure 16 aggregates the costs of the manufacturing processes into our decision tree defined earlier in Chapter 1. As is indicated in Figure 16, the percentage cost breakdown acts as a guide to future research and development expenditures for improving the Tray Pack manufacturing process.

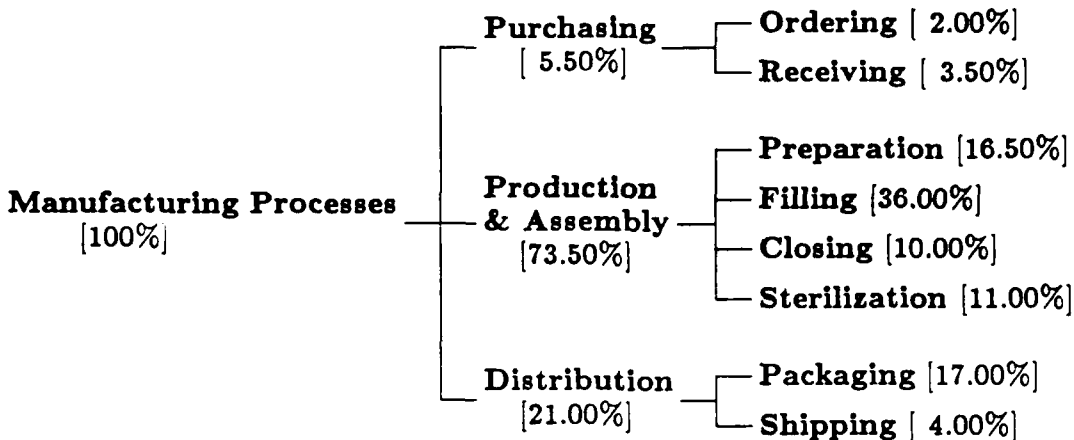


Figure 16: Process Decision Tree with Percentage Costs

C. General Recommendations for Future Developments

As another general guide to where improvements in the manufacturing process might come about to correct deficiencies in the entire Tray Pack manufacturing process, the manufacturers were asked to pinpoint those processes where improvements may come about as new advances in automation equipment or new processes of manufacturing.

Figure 17 summarizes the results from the manufacturer's opinions about where new improvements could be made for each of the various subprocesses. Within Figure 17, A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

—+3—+2—+1—0—-1— ■ —2—-3	Ordering Process
—+3—+2—+1—0—-1— ■ —2—-3	Receiving Process
—+3 ■ +2—+1—0—-1—-2—-3	Preparation Process
■ +3—+2—+1—0—-1—-2—-3	Filling Process
■ +3—+2—+1—0—-1—-2—-3	Closing Process
—+3—+2 ■ +1—0—-1—-2—-3	Sterilization Process
■ +3—+2—+1—0—-1—-2—-3	Packaging Process
—+3—+2 ■ +1—0—-1—-2—-3	Shipping Process

Figure 17: Possibilities for General Manufacturing Process Improvements

In interpreting Figure 17, Filling improvements are of primary importance, while Packaging and Closing share the second most important spot. New improvements in Preparation is third. The importance of new technological changes in the Filling process have been echoed throughout this report in Chapter 2 and the percentage cost breakdown embodied in Table 14 underscores its importance.

Packaging has also been shown to require some innovative ways of automating its processes since standardization already exists at this stage of the Tray Pack manufacturing process and various pieces of automated equipment are available to implement these improvements within the plants.

Improvements in the Closing process are needed because of the frequent dilemmas of the lid/can merge problem, material handling problems from closing to seaming, and maintaining seam integrity.

Improvements in the Preparation process are also needed to smooth production and reduce labor costs in these areas. Finally, improvements that would affect the Ordering, Receiving and Shipping operations are the development of a computerized information, inventory and scheduling system operable on a personal computer (PC) for tracking and identifying raw materials and finished goods. In this way, much of the paperwork and inefficiencies and eventual costs associated with the manufacture of Tray Packs could be streamlined.

While the report has offered one predominant viewpoint and approach to a cost driver analysis, at the end of the questionnaire, we asked the manufacturers to provide their opinion as to what additional comments and concerns may have been overlooked by our questionnaire process. Below is included one set of responses, which were felt to be quite relevant and informative:

Standardization of specifications as to raw materials preparation, and processes would reduce costs.

Also, allowing processors to use any acceptable (commercial) methods in the processing itself to yield an acceptable end item would lend flexibility.

Raw material criteria (especially spices, etc.) are overly restrictive when dealing in small amounts.

Slice size should be allowed to vary if serving size and end item are consistent.

Rapid evaluation and adoption of VECP's (i.e. Labelling or double stacking during shipment after appropriate testing) could save \$20,000,000 per year to the program.

Chapter 4. FINAL CODA

This report has pointed out , qualified, and quantified a number of the key cost components and factors that affect Tray Pack manufacturing costs.

Within Chapter 3, new equipment technologies have been pinpointed which might further realize these cost control measures. Most importantly, if the volume of Tray Packs is to increase beyond present levels and line throughput rates are to achieve the desired goal of 20 cans per minute (CPM), then many of these new technologies should be pushed forward.

This report does not attempt to be a panacea for identifying, quantifying and recommending all cost improvements possible in Tray Pack manufacturing but is simply a first step in this complex process and makes a concerted attempt to provide guidance for future efforts, research, and changes in optimizing Tray Pack manufacturing.

APPENDIX

III. General Manufacturing Questions

This question section requests background information on your present involvement with Tray Pack manufacturing. *This information will be held in strictest confidence.*

1. Background

Company _____ Date: _____

Name _____

How many Tray Packs total did you produce this last fiscal year? _____

2. Production Items

In the following tables, please check all the Tray Pack menu items within the four functional categories you have produced to date.

Entrees

- ☐ BBQ Beef
- ☐ Beef Stew
- ☐ Breakfast Bake
- ☐ Chicken ala king
- ☐ Chicken Stew/Gravy

Entrees

- ☐ Chicken w/ Noodles
- ☐ Chili Con Carne
- ☐ Creamed Gr. Beef
- ☐ Eggs w/Ham

Starches/Vegets

- ☐ Potato Salad
- ☐ Sweet Creamed Corn
- ☐
- ☐

Desserts

- ☐ Apple Dessert
- ☐ Apple Sauce
- ☐ Blueberry Dessert
- ☐ Chocolate Pudding
- ☐ Cherry Dessert

Table of One-Step Menu Items

Entrees

- ☐ BBQ Pork
- ☐ Beef and Macaroni
- ☐ Beef Pepper Steak
- ☐ Beef Tips w/Gravy
- ☐ Beef Pot Roast
- ☐ Canadian Bacon
- ☐ Chicken Breasts
- ☐ Chicken Cacciatore
- ☐ Franks in Brine
- ☐ Ham Slices
- ☐

Entrees

- ☐ Meatloaf w/Gravy
- ☐ Pork Sausage Links
- ☐ Pork Slices w/Gravy
- ☐ Roast Beef w/Gravy
- ☐ Roast Chicken
- ☐ Spaghetti w/Meatballs
- ☐ Swedish Meatballs
- ☐ Swiss Steak
- ☐ Turkey Sl.w/Gravy
- ☐
- ☐

Starches

- ☐ Beans w/Pork
- ☐ Buttered Noodles
- ☐ Buttered Potatoes
- ☐ Escalloped Potatoes
- ☐ Macaroni Cheese
- ☐ Macaroni Salad
- ☐ Spanish Rice
- ☐ Sweet Potatoes
- ☐ White Rice
- ☐
- ☐

Vegts/Desserts

- ☐ Glazed Carrots
- ☐ Green Beans
- ☐ Mixed Vegetables
- ☐ Peas and Carrots
- ☐ Peas/Mushrooms
- ☐ Sliced Carrots
- ☐ Whole Kernel Corn
- ☐ Fruit Cocktail
- ☐ Sliced Peaches
- ☐ Sliced Pears
- ☐ Pineapple/Syrup

Table of Two Step Menu Items

Hand Placement Items

- ☐ Lasagne
- ☐ Stuffed Cabbage
- ☐ Stuffed Peppers

Oven Bake Items

- ☐ Apple Coffee Cake
- ☐ Blueberry Cake
- ☐ Chocolate Cake
- ☐ Marble Cake
- ☐ Pound Cake
- ☐ Spice Cake

Table of Hand-Placement & Oven Bake Menu Items

3. Ordering: Process of acquiring raw materials and necessary supplies for Tray Pack manufacturing

(Please circle the appropriate response or fill the blank line as best as possible.)

☐ yes ☐ no Have you had any problems ordering can bottoms and lids from Central States?

If yes, please check as many of the items below as necessary:

- | | |
|--|---|
| <input type="checkbox"/> Inadequate Lead Time | <input type="checkbox"/> Slow Delivery time |
| <input type="checkbox"/> Quality of lids/bottoms | <input type="checkbox"/> Other: _____ |

☐ yes ☐ no Have you had problems with the securing of labels for the cans?

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| <input type="checkbox"/> Cost of Items | <input type="checkbox"/> Quality of Items | |
| <input type="checkbox"/> Lead Times | <input type="checkbox"/> Delivery Times | <input type="checkbox"/> Other _____ |

☐ yes ☐ no Do you have problems with the general acquisition and supply of meat items for Tray Pack production?

If yes, please check as many of the items below as necessary:

- | | | |
|---------------------------------------|------------------------------------|--------------------------------------|
| <input type="checkbox"/> Beef | <input type="checkbox"/> Hamburger | <input type="checkbox"/> Pork |
| <input type="checkbox"/> Bacon | <input type="checkbox"/> Chicken | <input type="checkbox"/> Turkey |
| <input type="checkbox"/> Frankfurters | <input type="checkbox"/> Sausage | <input type="checkbox"/> Other _____ |

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| <input type="checkbox"/> Cost of Items | <input type="checkbox"/> Quality of Items | |
| <input type="checkbox"/> Lead Times | <input type="checkbox"/> Delivery Times | <input type="checkbox"/> Other _____ |

☐ yes ☐ no Do you have problems with the general acquisition and supply of dairy items for Tray Pack production?

If yes, please check as many of the items below as necessary:

- | | | |
|---------------------------------|---------------------------------------|--------------------------------------|
| <input type="checkbox"/> Milk | <input type="checkbox"/> Butter | <input type="checkbox"/> Eggs |
| <input type="checkbox"/> Cheese | <input type="checkbox"/> Cream Cheese | <input type="checkbox"/> Other _____ |

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| <input type="checkbox"/> Cost of Items | <input type="checkbox"/> Quality of Items | |
| <input type="checkbox"/> Lead Times | <input type="checkbox"/> Delivery Times | <input type="checkbox"/> Other _____ |

☐ yes ☐ no Do you have problems with the general acquisition and supply of fresh vegetable items for Tray Pack production?

If yes, please check as many of the items below as necessary:

- | | | | |
|------------------------------------|----------------------------------|--------------------------------------|--------------------------------------|
| <input type="checkbox"/> Peas | <input type="checkbox"/> Beans | <input type="checkbox"/> Lima Beans | <input type="checkbox"/> Chili Beans |
| <input type="checkbox"/> Mushrooms | <input type="checkbox"/> Carrots | <input type="checkbox"/> Cabbage | <input type="checkbox"/> Corn |
| <input type="checkbox"/> Tomatoes | <input type="checkbox"/> Peppers | <input type="checkbox"/> Other _____ | |

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| <input type="checkbox"/> Cost of Items | <input type="checkbox"/> Quality of Items | |
| <input type="checkbox"/> Lead Times | <input type="checkbox"/> Delivery Times | <input type="checkbox"/> Other _____ |

☐ **yes** ☐ **no** Do you have any problems with the general acquisition and supply of Starch items?
If yes, please check as many of the items below as necessary:

- | | | |
|--|-----------------------------------|--------------------------------------|
| <input type="checkbox"/> Rice | <input type="checkbox"/> Flour | <input type="checkbox"/> Wheat |
| <input type="checkbox"/> Potatoes | <input type="checkbox"/> Macaroni | <input type="checkbox"/> Spaghetti |
| <input type="checkbox"/> Cereals/Grain | <input type="checkbox"/> Noodles | <input type="checkbox"/> Other _____ |

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| <input type="checkbox"/> Cost of Items | <input type="checkbox"/> Quality of Items | |
| <input type="checkbox"/> Lead Times | <input type="checkbox"/> Delivery Times | <input type="checkbox"/> Other _____ |

☐ **yes** ☐ **no** Do you have any problem with the supply of sauces or related items?
If yes, please check as many of the items below as necessary:

- | | | |
|---------------------------------------|---------------------------------------|--------------------------------------|
| <input type="checkbox"/> Tomato sauce | <input type="checkbox"/> Tomato Paste | <input type="checkbox"/> Other _____ |
|---------------------------------------|---------------------------------------|--------------------------------------|

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| <input type="checkbox"/> Cost of Items | <input type="checkbox"/> Quality of Items | |
| <input type="checkbox"/> Lead Times | <input type="checkbox"/> Delivery Times | <input type="checkbox"/> Other _____ |

☐ **yes** ☐ **no** Do you have any problems with the acquisition of dessert items?
If yes, please check as many of the items below as necessary:

- | | | |
|--------------------------------------|--------------------------------------|-------------------------------------|
| <input type="checkbox"/> Cherries | <input type="checkbox"/> Oranges | <input type="checkbox"/> Pineapples |
| <input type="checkbox"/> Peaches | <input type="checkbox"/> Blueberries | <input type="checkbox"/> Pears |
| <input type="checkbox"/> Other _____ | | |

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| <input type="checkbox"/> Cost of Items | <input type="checkbox"/> Quality of Items | |
| <input type="checkbox"/> Lead Times | <input type="checkbox"/> Delivery Times | <input type="checkbox"/> Other _____ |

☐ **yes** ☐ **no** Do you have any problems with the acquisition of spices and condiments?
If yes, please check as many of the items below as necessary:

- | | | |
|-------------------------------------|--|--------------------------------------|
| <input type="checkbox"/> Salt | <input type="checkbox"/> Pepper | <input type="checkbox"/> Brown Sugar |
| <input type="checkbox"/> Cornstarch | <input type="checkbox"/> Garlic Powder | <input type="checkbox"/> Yeast |
| <input type="checkbox"/> Molasses | <input type="checkbox"/> Nuts | <input type="checkbox"/> Other _____ |

If you had problems, what were the most important reasons for the problem:

- | | | |
|--|---|--------------------------------------|
| <input type="checkbox"/> Cost of Items | <input type="checkbox"/> Quality of Items | |
| <input type="checkbox"/> Lead Times | <input type="checkbox"/> Delivery Times | <input type="checkbox"/> Other _____ |

3. Ordering Process

a) For the *One Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Ordering* process, this item was so costly to *Order*. Please check as many of the items and reasons as apply.

If you did not produce any One Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> BBQ Beef	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Stew	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Breakfast Bake	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken ala king	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken Stew/Gravy	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken w/ Noodles	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chili Con Carne	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Creamed Gr.Beef	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Eggs w/Ham	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Potato Salad	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sweet Creamed Corn	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Apple Dessert	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Apple Sauce	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Blueberry Dessert	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chocolate Pudding	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Cherry Dessert	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____

b) For the *Two Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Ordering* process, this item was so costly to *Order*. Please check as many of the items and reasons as apply.

If you did not produce any Two-Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> BBQ Pork	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef and Macaroni	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Pepper Steak	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Tips w/Gravy	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Pot Roast	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Canadian Bacon	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken Breasts	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken Cacciatore	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Franks in Brine	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Ham Slices	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Meatloaf w/Gravy	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pork Sausage Links	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pork Slices w/Gravy	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Roast Beef w/Gravy	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Roast Chicken	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Spaghetti w/Meatballs	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Swedish Meatballs	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____

<input type="checkbox"/> Swiss Steak	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Turkey Sl.w/Gravy	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beans w/Pork	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Buttered Noodles	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Buttered Potatoes	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Escalloped Potatoes	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Macaroni Cheese	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Macaroni Salad	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Spanish Rice	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sweet Potatoes	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> White Rice	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Glazed Carrots	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Green Beans	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Mixed Vegetables	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Peas & Carrots	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Peas/Mushrooms	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sliced Carrots	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Whole Kernel Corn	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Fruit Cocktail	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sliced Peaches	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sliced Pears	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pineapples/Syrup	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____

c) For the *Hand Placement* Menu items you have produced, could you please identify the menu item and the reason why within the *Ordering* process, this item was so costly to *Order*. Please check as many of the items and reasons as apply.

If you did not produce any Hand Placement menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> Lasagne	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Stuffed Cabbage	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Stuffed Peppers	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____

d) For the *Oven Bake* Menu items you have produced, could you please identify the menu item and the reason why within the *Ordering* process, this item was so costly to *Order*. Please check as many of the items and reasons as apply.

If you did not produce any Oven Bake menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> Apple Coffee Cake	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Blueberry Cake	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chocolate Cake	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Marble Cake	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pound Cake	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Spice Cake	<input type="checkbox"/> Raw Material\$	<input type="checkbox"/> Material Quality	<input type="checkbox"/> Other\$_____

e) In the following table, please *estimate as accurately as possible* the percentage costs of your Ordering sub-process based on the following cost categories (If a cost item is not appropriate, please leave it blank):

Raw Material \$	<i>Direct\$ (Food Items/Cans)</i>	<input type="text"/> %
	<i>Indirect\$ (Wastage/Spoilage)</i>	<input type="text"/> %
Labor \$	<i>Direct\$ (Personnel)</i>	<input type="text"/> %
	<i>Indirect\$ (Training/Overtime)</i>	<input type="text"/> %
Equipment \$	<i>Direct\$ (Capital Expenditures) ..</i>	<input type="text"/> %
	<i>Indirect\$ (Operational/Repairs) ..</i>	<input type="text"/> %
Space \$	<i>Direct\$ (Cubic footage)</i>	<input type="text"/> %
	<i>Indirect\$ (Flexibility/Accessibility)</i>	<input type="text"/> %
Energy \$	<i>Direct\$ (Power/Water/Cooling) ..</i>	<input type="text"/> %
	<i>Indirect\$ (Breakdowns/Weather) .</i>	<input type="text"/> %
Maintenance\$ & Safety\$	<i>Direct\$ (Personnel)</i>	<input type="text"/> %
	<i>Indirect\$(Accidents/Vermin)</i>	<input type="text"/> %
Administrative\$	<i>Direct\$ (Personnel)</i>	<input type="text"/> %
	<i>Indirect\$ (Copying/Computing) ..</i>	<input type="text"/> %
SUMMARY\$	GRAND TOTALS	[100%]

4. Receiving: Process of receiving raw materials from rail and truck deliveries, storing of these items, and retrieving them from the Warehouse.

a) For the *One Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Receiving* process, this item was so costly to *Receive*. Please check as many of the items and reasons as apply.

If you did not produce any One-Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> BBQ Beef	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Stew	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Breakfast Bake	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken ala king	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken Stew/Gravy	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken w/ Noodles	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chili Con Carne	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Creamed Gr.Beef	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Eggs w/Ham	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Potato Salad	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sweet Creamed Corn	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Apple Dessert	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Apple Sauce	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Blueberry Dessert	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chocolate Pudding	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Cherry Dessert	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____

b) For the *Two-Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Receiving* process, this item was so costly to *Receive*. Please check as many of the items and reasons as apply.

If you did not produce any Two-Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> BBQ Pork	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef and Macaroni	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Pepper Steak	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Tips w/Gravy	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Pot Roast	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Canadian Bacon	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken Breasts	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken Cacciatore	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Franks in Brine	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Ham Slices	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Meatloaf w/Gravy	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pork Sausage Links	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pork Slices w/Gravy	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Roast Beef w/Gravy	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Roast Chicken	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Spaghetti w/Meatballs	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Swedish Meatballs	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____

<input type="checkbox"/> Swiss Steak	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Turkey Sl.w/Gravy	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beans w/Pork	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Buttered Noodles	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Buttered Potatoes	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Escalloped Potatoes	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Macaroni Cheese	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Macaroni Salad	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Spanish Rice	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sweet Potatoes	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> White Rice	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Glazed Carrots	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Green Beans	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Mixed Vegetables	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Peas & Carrots	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Peas/Mushrooms	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sliced Carrots	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Whole Kernel Corn	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Fruit Cocktail	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sliced Peaches	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sliced Pears	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pineapples/Syrup	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____

c) For the *Hand Placement* Menu items you have produced, could you please identify the menu item and the reason why within the *Receiving* process, this item was so costly to *Receive*. Please check as many of the items and reasons as apply.

If you did not produce any Hand Placement menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> Lasagne	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Stuffed Cabbage	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Stuffed Peppers	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____

d) For the *Oven Bake* Menu items you have produced, could you please identify the menu item and the reason why within the *Receiving* process, this item was so costly to *Receive*. Please check as many of the items and reasons as apply.

If you did not produce any Oven Bake menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> Apple Coffee Cake	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Blueberry Cake	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chocolate Cake	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Marble Cake	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pound Cake	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Spice Cake	<input type="checkbox"/> Spoilage\$	<input type="checkbox"/> Warehouse\$	<input type="checkbox"/> Other\$_____

e) In the following table, please *estimate as accurately as possible* the **percentage costs** of your **Receiving** sub-process based on the following cost categories (If a cost item is not appropriate, please leave it blank):

Raw Material \$	<i>Direct\$ (Food Items/Cans)</i>	_____ %
	<i>Indirect\$ (Wastage/Spoilage)</i>	_____ %
Labor \$	<i>Direct\$ (Personnel)</i>	_____ %
	<i>Indirect\$ (Training/Overtime)</i>	_____ %
Equipment \$	<i>Direct\$ (Capital Expenditures) ..</i>	_____ %
	<i>Indirect\$ (Operational/Repairs) ..</i>	_____ %
Space \$	<i>Direct\$ (Cubic footage)</i>	_____ %
	<i>Indirect\$ (Flexibility/Accessibility)</i>	_____ %
Energy \$	<i>Direct\$ (Power/Water/Cooling) ..</i>	_____ %
	<i>Indirect\$ (Breakdowns/Weather) .</i>	_____ %
Maintenance\$ & Safety\$	<i>Direct\$ (Personnel)</i>	_____ %
	<i>Indirect\$ (Accidents/Vermin)</i>	_____ %
Administrative\$	<i>Direct\$ (Personnel)</i>	_____ %
	<i>Indirect\$ (Copying/Computing) ..</i>	_____ %
SUMMARY\$	GRAND TOTALS	[100%]

f) Below is a series of activities concerning the detailed operations within the **Receiving** sub-process. Could you please weight the importance of investing in new technologies (equipment and processes) to assist the overall **Receiving** sub-process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

___+3___+2___+1___0___-1___-2___-3	<i>Reducing Delivery delays</i>
___+3___+2___+1___0___-1___-2___-3	<i>Improved Information System on Deliveries</i>
___+3___+2___+1___0___-1___-2___-3	<i>Unpacking/Identifying items and Storing them</i>
___+3___+2___+1___0___-1___-2___-3	<i>Improving Quality of Raw Materials</i>
___+3___+2___+1___0___-1___-2___-3	<i>Increasing utilization of Dry Goods storage space</i>
___+3___+2___+1___0___-1___-2___-3	<i>Increasing utilization of Freezer space</i>
___+3___+2___+1___0___-1___-2___-3	<i>Increasing utilization of Refrigeration space</i>
___+3___+2___+1___0___-1___-2___-3	<i>Other _____</i>

5. Preparation: Process of preparing the raw materials for the specific menu item

a) For the *One Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Preparation* process, this item was so costly to *Prepare*. Please check as many of the items and reasons as apply.

If you did not produce any One Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> BBQ Beef	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Beef Stew	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Breakfast Bake	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chicken ala king	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chicken Stew/Gravy	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chicken w/ Noodles	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chili Con Carne	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Creamed Gr.Beef	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Eggs w/Ham	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Potato Salad	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Sweet Creamed Corn	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Apple Dessert	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Apple Sauce	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Blueberry Dessert	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chocolate Pudding	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Cherry Dessert	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____

b) For the *Two Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Preparation* process, this item was so costly to *Prepare*. Please check as many of the items and reasons as apply.

If you did not produce any Two Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> BBQ Pork	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Beef and Macaroni	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Beef Pepper Steak	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Beef Tips w/Gravy	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Beef Pot Roast	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Canadian Bacon	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chicken Breasts	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chicken Cacciatore	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Franks in Brine	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Ham Slices	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Meatloaf w/Gravy	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Pork Sausage Links	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Pork Slices w/Gravy	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Roast Beef w/Gravy	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Roast Chicken	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Spaghetti w/Meatballs	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Swedish Meatballs	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Swiss Steak	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____

<input type="checkbox"/> Turkey Sl.w/Gravy	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Beans w/Pork	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Buttered Noodles	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Buttered Potatoes	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Escalloped Potatoes	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Macaroni Cheese	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Macaroni Salad	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Spanish Rice	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Sweet Potatoes	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> White Rice	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Glazed Carrots	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Green Beans	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Mixed Vegetables	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Peas & Carrots	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Peas/Mushrooms	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Sliced Carrots	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Whole Kernel Corn	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Fruit Cocktail	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Sliced Peaches	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Sliced Pears	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Pineapples/Syrup	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____

c) For the *Hand Placement* Menu items you have produced, could you please identify the menu item and the reason why within the *Preparation* process, this item was so costly to *Prepare*. Please check as many of the items and reasons as apply.

If you did not produce any Hand Placement menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> Lasagne	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Stuffed Cabbage	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Stuffed Peppers	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____

d) For the *Oven Bake* Menu items you have produced, could you please identify the menu item and the reason why within the *Preparation* process, this item was so costly to *Prepare*. Please check as many of the items and reasons as apply.

If you did not produce any Oven Bake menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> Apple Coffee Cake	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Blueberry Cake	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chocolate Cake	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Marble Cake	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Pound Cake	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Spice Cake	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$ _____

e) In the following table, please *estimate as accurately as possible* the **percentage costs** of your **Preparation** sub-process based on the following cost categories (If a cost item is not appropriate, please leave it blank):

Raw Material \$	<i>Direct\$ (Food Items/Cans)</i>	_____ %
	<i>Indirect\$ (Wastage/Spoilage)</i>	_____ %
Labor \$	<i>Direct\$ (Personnel).....</i>	_____ %
	<i>Indirect\$ (Training/Overtime)</i>	_____ %
Equipment \$	<i>Direct\$ (Capital Expenditures) ..</i>	_____ %
	<i>Indirect\$ (Operational/Repairs) ..</i>	_____ %
Space \$	<i>Direct\$ (Cubic footage).....</i>	_____ %
	<i>Indirect\$ (Flexibility/Accessibility)</i>	_____ %
Energy \$	<i>Direct\$ (Power/Water/Cooling) ..</i>	_____ %
	<i>Indirect\$ (Breakdowns/Weather) .</i>	_____ %
Maintenance\$ & Safety\$	<i>Direct\$ (Personnel).....</i>	_____ %
	<i>Indirect\$(Accidents/Vermin)</i>	_____ %
Administrative\$	<i>Direct\$ (Personnel).....</i>	_____ %
	<i>Indirect\$ (Copying/Computing) ..</i>	_____ %
SUMMARY\$	GRAND TOTALS	[100%]

f) Below is a series of activities concerning the detailed *operations* within the **Preparation** sub-process. Could you please weight the importance of improvements in manufacturing technologies (equipment and processes) for the **Preparation** process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

___+3___+2___+1___0___-1___-2___-3	<i>Improved Trimming and Dicing operations</i>
___+3___+2___+1___0___-1___-2___-3	<i>Improved Quality Inspection of Raw Materials</i>
___+3___+2___+1___0___-1___-2___-3	<i>Better utilization of Refrigeration storage</i>
___+3___+2___+1___0___-1___-2___-3	<i>Better utilization of Freezer areas</i>
___+3___+2___+1___0___-1___-2___-3	<i>Flexible Preparation Equipment</i>
___+3___+2___+1___0___-1___-2___-3	<i>Flexible Cooking Space</i>
___+3___+2___+1___0___-1___-2___-3	<i>Adequate washing and sink areas</i>
___+3___+2___+1___0___-1___-2___-3	<i>Other _____</i>

6. Filling: Process of filling the cans with the menu item, inspecting the can contents, weighing the contents, and transferring the can to the closing operation

a) For the *One Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Filling* process, this item was so costly to *Fill*. Please check as many of the items and reasons as apply.

If you did not produce any One Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> BBQ Beef	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Stew	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Breakfast Bake	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken ala king	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken Stew/Gravy	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken w/ Noodles	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chili Con Carne	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Creamed Gr.Beef	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Eggs w/Ham	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Potato Salad	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sweet Creamed Corn	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Apple Dessert	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Apple Sauce	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Blueberry Dessert	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chocolate Pudding	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Cherry Dessert	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____

b) For the *Two Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Filling* process, this item was so costly to *Fill*. Please check as many of the items and reasons as apply.

If you did not produce any Two Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> BBQ Pork	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef and Macaroni	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Pepper Steak	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Tips w/Gravy	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Pot Roast	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Canadian Bacon	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken Breasts	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken Cacciatore	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Franks in Brine	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Ham Slices	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Meatloaf w/Gravy	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pork Sausage Links	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pork Slices w/Gravy	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Roast Beef w/Gravy	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Roast Chicken	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Spaghetti w/Meatballs	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____

<input type="checkbox"/> Swedish Meatballs	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Swiss Steak	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Turkey Sl.w/Gravy	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beans w/Pork	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Buttered Noodles	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Buttered Potatoes	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Escalloped Potatoes	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Macaroni Cheese	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Macaroni Salad	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Spanish Rice	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sweet Potatoes	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> White Rice	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Glazed Carrots	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Green Beans	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Mixed Vegetables	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Peas & Carrots	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Peas/Mushrooms	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sliced Carrots	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Whole Kernel Corn	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Fruit Cocktail	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sliced Peaches	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sliced Pears	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pineapples/Syrup	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____

c) For the *Hand Placement* Menu items you have produced, could you please identify the menu item and the reason why within the *Filling* process, this item was so costly to *Fill*. Please check as many of the items and reasons as apply.

If you did not produce any Hand Placement menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> Lasagne	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Stuffed Cabbage	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Stuffed Peppers	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____

d) For the *Oven Bake* Menu items you have produced, could you please identify the menu item and the reason why within the *Filling* process, this item was so costly to *Fill*. Please check as many of the items and reasons as apply.

If you did not produce any Oven Bake menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> Apple Coffee Cake	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Blueberry Cake	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chocolate Cake	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Marble Cake	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pound Cake	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Spice Cake	<input type="checkbox"/> Labor\$	<input type="checkbox"/> Equipment\$	<input type="checkbox"/> Other\$_____

e) In the following table, please estimate as accurately as possible the percentage costs of your Filling sub-process based on the following cost categories (If a cost item is not appropriate, please leave it blank):

Raw Material \$	Direct\$ (Food Items/Cans)	_____%
	Indirect\$ (Wastage/Spoilage)	_____%
Labor \$	Direct\$ (Personnel).....	_____%
	Indirect\$ (Training/Overtime)....	_____%
Equipment \$	Direct\$ (Capital Expenditures) ..	_____%
	Indirect\$ (Operational/Repairs) ..	_____%
Space \$	Direct\$ (Cubic footage).....	_____%
	Indirect\$ (Flexibility/Accessibility)	_____%
Energy \$	Direct\$ (Power/Water/Cooling) ..	_____%
	Indirect\$ (Breakdowns/Weather) .	_____%
Maintenance\$ & Safety\$	Direct\$ (Personnel).....	_____%
	Indirect\$(Accidents/Vermin)	_____%
Administrative\$	Direct\$ (Personnel).....	_____%
	Indirect\$ (Copying/Computing) ..	_____%
SUMMARY\$	GRAND TOTALS	[100%]

f) Below is a series of activities concerning the detailed operations within the Filling sub-process. Could you please weight the importance of improvements in manufacturing technologies (equipment and processes) for the Filling process. A +3 indicates most important while a -3 indicates least importance, and a 0 weight indicates no opinion.

___+3___+2___+1___0___-1___-2___-3	Automated Can and Lid Stacking
___+3___+2___+1___0___-1___-2___-3	Automated Can Washing
___+3___+2___+1___0___-1___-2___-3	Automated Placement of Large Menu items
___+3___+2___+1___0___-1___-2___-3	Automated Piston & Liquid Filling operations
___+3___+2___+1___0___-1___-2___-3	Automated Check-weigh reject operations
___+3___+2___+1___0___-1___-2___-3	Automated Can transfer between stations
___+3___+2___+1___0___-1___-2___-3	Other _____

7. Closing: Process of joining the bottoms, lids and contents of each can, transferring the can to the seamer, closing the can, washing the can and collecting the cans into a unit load

a) For the *One Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Closing* process, this item was so costly to *Close*. Please check as many of the items and reasons as apply.

If you did not produce any One Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> BBQ Beef	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Beef Stew	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Breakfast Bake	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chicken ala king	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chicken Stew/Gravy	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chicken w/ Noodles	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chili Con Carne	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Creamed Gr.Beef	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Eggs w/Ham	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Potato Salad	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Sweet Creamed Corn	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Apple Dessert	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Apple Sauce	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Blueberry Dessert	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chocolate Pudding	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Cherry Dessert	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____

b) For the *Two-Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Closing* process, this item was so costly to *Close*. Please check as many of the items and reasons as apply.

If you did not produce any Two-Step menu items, please go on to the next question.

ENTREES

REASONS for Problem

<input type="checkbox"/> BBQ Pork	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Beef and Macaroni	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Beef Pepper Steak	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Beef Tips w/Gravy	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Beef Pot Roast	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Canadian Bacon	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chicken Breasts	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chicken Cacciatore	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Franks in Brine	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Ham Slices	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Meatloaf w/Gravy	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Pork Sausage Links	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Pork Slices w/Gravy	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Roast Beef w/Gravy	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Roast Chicken	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Spaghetti w/Meatballs	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipt\$	<input type="checkbox"/> Other\$ _____

<input type="checkbox"/> Swedish Meatballs	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Swiss Steak	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Turkey Sl.w/Gravy	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Beans w/Pork	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Buttered Noodles	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Buttered Potatoes	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Escalloped Potatoes	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Macaroni Cheese	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Macaroni Salad	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Spanish Rice	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Sweet Potatoes	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> White Rice	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Glazed Carrots	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Green Beans	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Mixed Vegetables	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Peas & Carrots	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Peas/Mushrooms	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Sliced Carrots	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Whole Kernel Corn	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Fruit Cocktail	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Sliced Peaches	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Sliced Pears	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Pineapples/Syrup	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____

c) For the *Hand Placement* Menu items you have produced, could you please identify the menu item and the reason why within the *Closing* process, this item was so costly to *Close*. Please check as many of the items and reasons as apply.

If you did not produce any Hand Placement menu items, please go on to the next question.

ENTREES

REASONS for Problem

<input type="checkbox"/> Lasagne	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Stuffed Cabbage	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Stuffed Peppers	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipment\$	<input type="checkbox"/> Other\$ _____

d) For the *Oven Bake* Menu items you have produced, could you please identify the menu item and the reason why within the *Closing* process, this item was so costly to *Close*. Please check as many of the items and reasons as apply.

If you did not produce any Oven Bake menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> Apple Coffee Cake	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Blueberry Cake	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipment\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Chocolate Cake	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Marble Cake	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Pound Cake	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____
<input type="checkbox"/> Spice Cake	<input type="checkbox"/> Lid/Can Merge \$	<input type="checkbox"/> Closing Equipmt\$	<input type="checkbox"/> Other\$ _____

e) In the following table, please *estimate as accurately as possible* the **percentage costs** of your **Closing** sub-process based on the following cost categories (If a cost item is not appropriate, please leave it blank):

Labor \$	<i>Direct\$ (Personnel).....</i>	_____ %
	<i>Indirect\$ (Training/Overtime)....</i>	_____ %
Equipment \$	<i>Direct\$ (Capital Expenditures) ..</i>	_____ %
	<i>Indirect\$ (Operational/Repairs) ..</i>	_____ %
Space \$	<i>Direct\$ (Cubic footage).....</i>	_____ %
	<i>Indirect\$ (Flexibility/Accessibility)</i>	_____ %
Energy \$	<i>Direct\$ (Power/Water/Cooling) ..</i>	_____ %
	<i>Indirect\$ (Breakdowns/Weather) .</i>	_____ %
Maintenance\$ & Safety\$	<i>Direct\$ (Personnel).....</i>	_____ %
	<i>Indirect\$(Accidents/Vermin)</i>	_____ %
Administrative\$	<i>Direct\$ (Personnel).....</i>	_____ %
	<i>Indirect\$ (Copying/Computing) ..</i>	_____ %
SUMMARY\$	GRAND TOTALS	[100%]

f) Below is a series of activities concerning the detailed *operations* within the **Closing** sub-process. Could you please weight the importance of the operation to the overall manufacturing costs for this sub-process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Automated Lid/Tray Merge</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Automated Can transfer between closure to seamer</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Faster Seaming process (reliability/repair)</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Automated Quality/Check of Seam</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Automated Can washing at outfeed of seamer</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Automated Stacking of cans into a unit load</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Other _____</i>

8. Sterilization: Process of loading the unit load into the Sterilizer(s), cooking the cans, controlling the process, unloading the cans and transferring them to the Packaging area.

a) For the *One-Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Sterilization* process, this item was so costly to *Sterilize*. Please check as many of the items and reasons as apply.

If you did not produce any One-Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> BBQ Beef	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Stew	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Breakfast Bake	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken ala king	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken Stew/Gravy	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken w/ Noodles	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chili Con Carne	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Creamed Gr.Beef	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Eggs w/Ham	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Potato Salad	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sweet Creamed Corn	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Apple Dessert	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Apple Sauce	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Blueberry Dessert	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chocolate Pudding	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Cherry Dessert	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____

b) For the *Two Step* Menu items you have produced, could you please identify the menu item and the reason why within the *Sterilization* process, this item was so costly to *Sterilize*. Please check as many of the items and reasons as apply.

If you did not produce any Two Step menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> BBQ Pork	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload \$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef and Macaroni	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Pepper Steak	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Tips w/Gravy	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beef Pot Roast	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Canadian Bacon	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken Breasts	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chicken Cacciatore	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Franks in Brine	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Ham Slices	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Meatloaf w/Gravy	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pork Sausage Links	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pork Slices w/Gravy	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Roast Beef w/Gravy	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Roast Chicken	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Spaghetti w/Meatballs	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Swedish Meatballs	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____

<input type="checkbox"/> Swiss Steak	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Turkey Sl.w/Gravy	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Beans w/Pork	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Buttered Noodles	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Buttered Potatoes	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Escalloped Potatoes	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Macaroni Cheese	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Macaroni Salad	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Spanish Rice	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sweet Potatoes	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> White Rice	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Glazed Carrots	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Green Beans	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Mixed Vegetables	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Peas & Carrots	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Peas/Mushrooms	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sliced Carrots	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Whole Kernel Corn	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Fruit Cocktail	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sliced Peaches	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Sliced Pears	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pineapples/Syrup	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____

c) For the *Hand Placement* Menu items you have produced, could you please identify the menu item and the reason why within the *Sterilization* process, this item was so costly to *Sterilize*. Please check as many of the items and reasons as apply.

If you did not produce any Hand Placement menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> Lasagne	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Stuffed Cabbage	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Stuffed Peppers	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____

d) For the *Oven Bake* Menu items you have produced, could you please identify the menu item and the reason why within the *Sterilization* process, this item was so costly to *Sterilize*. Please check as many of the items and reasons as apply.

If you did not produce any Oven Bake menu items, please go on to the next question.

ITEMS

REASONS for Problem

<input type="checkbox"/> Apple Coffee Cake	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Loading/Unloading\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Blueberry Cake	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Loading/Unloading\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Chocolate Cake	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Marble Cake	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Pound Cake	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____
<input type="checkbox"/> Spice Cake	<input type="checkbox"/> Sterilizer Control\$	<input type="checkbox"/> Load/Unload\$	<input type="checkbox"/> Other\$_____

e) In the following table, please *estimate as accurately as possible* the **percentage costs** of your **Sterilization** sub-process based on the following cost categories. (If a cost item is not appropriate, please leave it blank)

Labor \$	<i>Direct\$ (Personnel)</i>	_____ %
	<i>Indirect\$ (Training/Overtime)</i>	_____ %
Equipment \$	<i>Direct\$ (Capital Expenditures)</i> ..	_____ %
	<i>Indirect\$ (Operational/Repairs)</i> ..	_____ %
Space \$	<i>Direct\$ (Cubic footage)</i>	_____ %
	<i>Indirect\$ (Flexibility/Accessibility)</i>	_____ %
Energy \$	<i>Direct\$ (Power/Water/Cooling)</i> ..	_____ %
	<i>Indirect\$ (Breakdowns/Weather)</i> .	_____ %
Maintenance\$ & Safety\$	<i>Direct\$ (Personnel)</i>	_____ %
	<i>Indirect\$(Accidents/Vermin)</i>	_____ %
Administrative\$	<i>Direct\$ (Personnel)</i>	_____ %
	<i>Indirect\$ (Copying/Computing)</i> ..	_____ %
SUMMARY	GRAND TOTALS	[100%]

f) Below is a series of activities concerning the detailed *operations* within the **Sterilization** sub-process. Could you please weight the importance of the operation to the overall manufacturing costs for this sub-process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Automated Transfer of unit load into sterilizer</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Controlling Sterilizer for menu items</i> .
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Automated Unloading & Transfer to Packaging</i>
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	<i>Other</i> _____

9. Packaging

a) In the following table, please *estimate as accurately as possible* the **percentage costs** of your **Packaging** sub-process based on the following cost categories. (If a cost item is not appropriate, please leave it blank)

Raw Material \$	<i>Direct\$ (Packaging/Boxing Items)</i>	_____ %
	<i>Indirect\$ (Wastage/Spoilage)</i>	_____ %
Labor \$	<i>Direct\$ (Personnel).....</i>	_____ %
	<i>Indirect\$ (Training/Overtime)</i>	_____ %
Equipment \$	<i>Direct\$ (Capital Expenditures) ..</i>	_____ %
	<i>Indirect\$ (Operational/Repairs) ..</i>	_____ %
Space \$	<i>Direct\$ (Cubic footage).....</i>	_____ %
	<i>Indirect\$ (Flexibility/Accessibility)</i>	_____ %
Energy \$	<i>Direct\$ (Power/Water/Cooling) ..</i>	_____ %
	<i>Indirect\$ (Breakdowns/Weather) .</i>	_____ %
Maintenance\$ & Safety\$	<i>Direct\$ (Personnel).....</i>	_____ %
	<i>Indirect\$(Accidents/Vermin)</i>	_____ %
Administrative\$	<i>Direct\$ (Personnel).....</i>	_____ %
	<i>Indirect\$ (Copying/Computing) ..</i>	_____ %
SUMMARY\$	GRAND TOTALS.....	[100%]

b) Below is a series of activities concerning the detailed *operations* within the **Packaging** sub-process. Could you please weight the importance of improvements in manufacturing technologies (equipment and processes) to the *Packaging* process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Carton forming
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Pad insertion
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Boxing of cans
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Checking Quality of Packaging
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Labelling of shipping cartons
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Palletizing of shipping cartons into a unit load
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Sheathing of unit load
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Other:_____

10. Shipping: Identifying and storing unit loads, selecting trays for incubation, shipping unit loads, collecting damaged and returned cans.

a) In the following table, please *estimate as accurately as possible* the **percentage costs** of your Shipping sub-process based on the following cost categories. (If a cost item is not appropriate, please leave it blank)

Labor \$	Direct\$ (Personnel).....	_____ %
	Indirect\$ (Training/Overtime)....	_____ %
Equipment \$	Direct\$ (Capital Expenditures) ..	_____ %
	Indirect\$ (Operational/Repairs) ..	_____ %
Space \$	Direct\$ (Cubic footage).....	_____ %
	Indirect\$ (Flexibility/Accessibility)	_____ %
Energy \$	Direct\$ (Power/Water/Cooling) ..	_____ %
	Indirect\$ (Breakdowns/Weather) .	_____ %
Maintenance\$ & Safety\$	Direct\$ (Personnel).....	_____ %
	Indirect\$ (Accidents/Vermin)	_____ %
Administrative\$	Direct\$ (Personnel).....	_____ %
	Indirect\$ (Copying/Computing) ..	_____ %
SUMMARY\$	GRAND TOTALS.....	[100%]

b) Below is a series of activities concerning the detailed operations within the Shipping sub-process. Could you please weight the importance of improvements in manufacturing technologies (equipment and processes) to the Shipping process. A +3 indicates *most important* while a -3 indicates *least importance*, and a 0 weight indicates *no opinion*.

___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Automated Shipping warehouse storage
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Automating order picking of stored cans
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Automated material handling/transfer
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Other _____

11. Summary

Below is a series of questions concerning the overall *Sub-Processes*. Could you please weight each *Sub-Process* as to which is the *most labor intensive* in your Tray Pack manufacturing process. A +3 indicates *most labor intensive* while a -3 indicates *least labor intensive*, and a 0 weight indicates *no opinion*.

___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Ordering Process
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Receiving Process
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Preparation Process
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Filling Process
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Closing Process
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Sterilization Process
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Packaging Process
___+3 ___+2 ___+1 ___0 ___-1 ___-2 ___-3	Shipping Process

Given your previous answers to the questions among the eight sub-process categories for your general Tray Pack manufacturing operations, how would you allocate percentage (%) manufacturing costs among the eight sub-processes:

Ordering Process	_____ %
Receiving Process	_____ %
Preparation Process	_____ %
Filling Process	_____ %
Closing Process	_____ %
Sterilization Process	_____ %
Packaging Process	_____ %
Shipping Process	_____ %
Grand Totals	[100%]

[illegible]

Receiving Process

Filling Process

Sterilization Process

Packaging Process

Shipping Process

In the following section, please give us your *GENERAL* opinion as to how manufacturing costs might be better controlled if you feel we have overlooked or omitted some issues and problems that have not been addressed by the previous sections and questions in the questionnaire. *You may use the back of this sheet if necessary.*

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